



UNITED STATES NAVY

# MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN

Vol. 16

Friday, 6 October 1950

No. 6

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Cardiac Catheterization: Cardiac catheterization is now a recognized and accepted procedure and has proved its great value both as a research tool in cardiovascular physiology and as a diagnostic aid in certain types of heart disease, particularly those of congenital etiology. In this report the technical aspects of the procedure are discussed and some of the accomplishments in diagnosis and research are described.

Description of Method. A radio-opaque catheter, similar to a ureteral catheter, except that it has a built-in curve at its tip, ranging in size from No. 6 to No. 9, is inserted into the antecubital vein of either arm. The vein is usually first directly exposed through a small incision. The catheter is then guided, under fluoroscopic control, through the innominate vein into the superior vena cava. From there it can be advanced into the right auricle, the right ventricle and either pulmonary artery from its origin to one of its smallest divisions. In addition, the catheter tip can be directed down the inferior vena cava into a renal vein, into a hepatic vein, into the coronary sinus, or where openings exist between the right and left chambers of the heart it may also be guided into the left auricle, a pulmonary vein, the left ventricle or the aorta. It requires little imagination to appreciate the difference between the theoretical possibility of the accomplishment of these objectives and their realization in practice. However, with experience and careful technic, a skillful operator can attain his objective in a reasonably high percentage of cases.

Two types of investigation are then commonly carried out. The distal end of the catheter may be attached to an appropriate recording device, and a measurement made of the blood pressure that exists in the portion of the circulatory system where the tip of the catheter is placed. Blood can be drawn through the catheter and, with due precautions to prevent its exposure to air, can be analyzed for its oxygen content. In addition to these 2 procedures, the tip of the catheter can be converted into an exploring electrode and endocardial electrocardiograms recorded; and blood obtained from the coronary sinus can be analyzed not only for its oxygen content but also for other substances important in cardiac metabolism.

Precautions and Hazards. Because of the dramatic nature of the procedure the authors of the early articles published were almost always at pains to emphasize its comparative safety and the lack of untoward consequences. The descriptions of their technics were frequently accompanied by statements of the number of catheterizations that had been performed without ill effects. Such statements were desirable at the time to establish the method as the legitimate medical procedure that it is. However, there has been such an overemphasis on the simplicity and safety of the method that comparatively untrained physicians, surgeons, and radiologists have mistakenly thought that they could undertake it with success and impunity. There are real as well as potential hazards in the technic that are multiplied many times in the hands of untrained or careless operators. There are technical tricks that must be learned by proper training and experience; only experience,



too, will give the requisite knowledge and judgment to permit the proper evaluation of results and to avoid the errors inevitably resulting from too little knowledge. It is the authors' opinion that cardiac catheterization should only be carried out in laboratories that are adequately equipped and by operators who have been fully trained under competent supervision.

With one exception, the reported studies of human beings who have died soon after catheterization have not shown lesions of the right side of the heart that might be attributable to this procedure, and some studies on animals have also given negative results. Nevertheless, there are reports of subendocardial hemorrhages, mural thrombi and small infarctions occurring in dogs killed at periods varying from a few hours to weeks after catheterization.

Rhythm disturbances of some degree will develop in almost every patient in whom the catheter is placed in, or passes through, the right ventricle. The abnormalities usually disappear promptly when the catheter tip is either advanced into the pulmonary artery or withdrawn into the right auricle, but persistence of bundle-branch block or of ventricular tachycardia have been observed for hours after complete withdrawal of the catheter. The obvious hazard is the development of ventricular fibrillation or standstill. This hazard is probably greatest in patients who already have irritable hearts or diseased or failing myocardiums; patients with marked coronary and rheumatic disease and fully digitalized patients fall into this group. Disturbance of auricular rhythm, developing when the tip of the catheter is in the right auricle, are much less common, but do take place. Ectopic auricular beats, auricular tachycardia, and fibrillation have all been encountered. These, too, usually disappear when the position of the catheter tip is changed or removed from the auricle.

The danger of embolization from the procedure is not great. Air emboli to the periphery have been reported in patients with a right-to-left shunt in the heart; if they occur in the lungs in patients with normally closed cardiac septums, they are apparently innocuous. There are no known published reports of emboli from dislodged thrombi either pre-existing in the heart or developing in the heart or venous system consequent to the procedure. However, pulmonary infarctions have been known to occur shortly after catheterization, especially in patients with auricular fibrillation.

Infection is a theoretical danger, but with proper aseptic technic and prophylactic use of antibiotics, this hazard should be infrequent. Venospasm in the arm may prevent manipulation of the catheter, and on rare occasions has necessitated surgical cut-down to permit withdrawal. Some patients may exhibit keloid formation at the incisional site.

Thus, this procedure is not one to be undertaken casually or by the untrained. The technic, however, is one of great usefulness, and many thousand cardiac

catheterizations have been done in this country and abroad with no ill effects. The reported or known number of occasions when serious consequences have occurred comprise a small handful and even in this small group the complications were often attributable to the underlying heart disease and incidental to the technical maneuver. Nevertheless, to reduce the occurrence of untoward results to the minimum it is essential that certain rules be strictly observed: the entire procedure, from beginning to end, must be constantly monitored by a direct-reading electrocardiographic machine, such as a direct writer, a cardioscope, or a cathode-ray oscillograph; and the tip of the catheter should not be allowed to remain in the right ventricle, except for the brief period necessary to obtain essential observations in that chamber. When disorders of the heart beat or rhythm occur the catheter should be withdrawn from the ventricle, and if they do not immediately disappear, the entire procedure should be terminated. If the patient is distressed or uncomfortable for no apparent reason, or if the operator is in any doubt about the wisdom of continuing the catheterization, it should be immediately abandoned. Suitable facilities for the handling of any circulatory emergency should be immediately available. The duration of fluoroscopic observation should be held within a safe interval.

A further aspect of the problem is the necessity of providing adequate facilities for the training of doctors who will use the technic diagnostically in clinical centers throughout the country. At the present time most of the laboratories where proper training can be obtained are chiefly concerned with the education of research investigators.

The employment of cardiac catheterization has greatly extended the field of knowledge in human cardiovascular physiology. Prior to its use there was comparatively little direct evidence concerning the physiology of the pulmonary circulation in man. What knowledge there was was based on inference from morphologic findings at postmortem examination, from animal experimentation, or from indirect studies. Now, within the space of 8 years, knowledge of the pulmonary circulation in health and disease has been so enlarged that in some ways more is known about it than of the systemic circulation. (New England J. Med., 31 August '50, L. B. Ellis and R. A. Bloomfield)

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Hospital Control of Sterilization and Therapeutic Abortion: During recent years considerable attention has been given to sexual sterilization and therapeutic abortion. The experience of the larger clinics has been detailed in medical journals. Analysis of these reports shows that while certain indications are accepted with reasonable consistency, they also are sharply questioned on both medical and moral grounds. It is obvious that the solution to the problems of the justifiability of therapeutic abortion, if indeed it ever is found, must contain a careful balance of its inherent medical, social, legal, and moral aspects. Voluntary sexual sterilization,



while probably escaping the opprobrious charge of murder, raises many of the problems involved in therapeutic abortion. Sterilization, in basic concept, might be considered as prophylaxis against abortion.

Because abortion, whether therapeutic or criminal, has been carefully studied by others, the over-all legal and moral problems of abortion are omitted. No attempt is made to establish standards of justifiability for either therapeutic abortion or sterilization, since such standards devolve from medical and sectarian ethics. However, the legal aspect of sterilization, which is not well understood is presented briefly so that current statutory provisions may be included in whatever general or guiding principles others may develop.

Legal Aspects of Sterilization. To obtain accurate information regarding the legal status of sterilization, a letter was written to the Attorney General of each state. Replies were received from all but three (Arkansas, Maryland, Rhode Island). Critical articles in legal periodicals were studied. The data thus collected were discussed with members of the legal profession, including a Judge of Probate Court, to insure as far as possible the proper interpretation of this material.

Thirty-one states have passed sterilization statutes and 14 have not; the status of such laws in 3 states could not be determined. Review of the enacted laws by various courts resulted in some being declared unconstitutional, 5 of which were not subsequently amended or re-enacted. Thus, 19 states are without effective statutes and only 26 states presently have laws which are in good standing.

The various statutes divide sexual sterilization into the following categories: therapeutic, eugenic, and punitive, relative to intent; voluntary and nonvoluntary, relative to consent. All of the 26 existing laws provide for eugenic sterilization, 5 allow sterilization on therapeutic grounds, and 5 are punitive in nature. Provision for hearings, reviews, and appeals were found in only a few of the statutes. The laws of Georgia and Indiana establish means for proper review of all proposed nonvoluntary or directed sterilizations as well as the right to jury trial and appeal. These states also require that the next of kin or legal representative be notified of the proposed sterilization so that legal action may be instituted as is provided.

As far as could be determined, all the statutes now in force contained provisions for a board to initiate action for sexual sterilization. Sterilization being approved largely for eugenic reasons probably accounts for the statutory provisions for the operation on the feeble-minded, the insane, and those with inheritable defective disease while inmates in state institutions. Certain states specify the type of operation which must be performed to effect a legal sterilization, Connecticut alone requiring oophorectomy.

Existing statutes provide various grounds for the legal performance of sexual sterilization on inmates of state institutions. Physicians performing such operations

upon individuals not wards of the state become liable according to the legal status of such procedures. Under Common Law, upon which the majority of the statutes is based and which is applicable in the absence of enacted law, any physician who performs an operation designed to effect sterilization may be criminally liable on 2 counts--homicide in the event of otherwise unexplainable death, and mayhem. Mayhem requires that the maiming be done with legal malice. If consent to operation is freely given, malice generally is not deemed to have occurred. It should be emphasized that each state develops its own interpretations of its laws and that legal phraseology may produce unexpected complications. Thus, if the law of the state includes the words, rendering useless, applied to a member or an organ of a human being, there is a distinct possibility that a decision may be given which would establish the physician's liability under the law. Indiana, Mississippi, Utah, and Virginia incorporate the following in their statutes:

"Nothing in this act shall be construed so as to prevent the medical or surgical treatment for sound therapeutic reasons...which treatment may incidentally involve the nullification or destruction of the reproductive functions."

It must be remarked that the use of such phrases as medical necessity and sound therapeutic reasons follow the pattern of abortion laws. The difficulty of determining the exact meaning of these words has led to the advice given in the Journal of the Indiana Medical Association: "To make as certain as human precaution can make it, that a physician might not be subjected to difficulties later on, he should have consultation with other physicians and ample evidence to prove that the abortion was actually necessary." Such sound advice should also be followed for sterilizing operations.

Prohibitory provisions for nontherapeutic, voluntary sterilization are contained in some statutes, that of Indiana providing "that such treatment shall be that which is legal and approved after due process of law." Penal provisions are contained in others, as in Iowa, Kansas, and Utah, where the laws state:

"Except as authorized by this act, every person who shall perform, encourage, assist in, or otherwise promote the performance of either of these operations (vasectomy and salpingectomy) for the purpose of destroying the powers of procreation, unless performance of such operation is a medical necessity, shall be guilty of a misdemeanor."

It appears evident that if a state has enacted a law containing prohibitory or penal provisions, the physician may become liable in performing a sterilizing operation, although properly evidenced medical necessity may avoid penalty.

Voluntary sexual sterilization, the principal concern of most physicians, has no definite legal status. As far as is known, there is no case on record in which an individual who gave consent for sterilization has brought suit against the



physician for performing the operation. Hence, there is no precedent. However, in considering other types of operations, the Indiana Supreme Court decided that "a person cannot hold a physician liable for performing unreasonable surgery where he has requested the physician to do so." The consent of the individual to submit to the operation with full knowledge as to what it involves should be sufficient protection against civil liability on the part of the operating physician, provided that the operation was performed without negligence.

Comment. In their purely medical aspects, therapeutic abortion and sterilization present no unusual problems. So considered they require simply that the treatment be proper for the disease involved. When their social, moral, and legal aspects are included, the problem ceases to be simple. There appears to be no fundamental disagreement that these operations may be performed on the grounds of medical necessity, even though what constitutes such grounds may be divergently interpreted. Private patients with substantial financial resources frequently are managed differently than staff patients existing on welfare allotments. Differences in treatment result also from differences in dogma. Legally, both procedures are permitted, but the provisions admit a wide range of interpretation. In short, there are no definite, unvarying criteria which may be applied to the proper performance of these procedures.

The hospital is a social institution wherein the members of its staff join forces to make available the requisite professional tools and assistants to assure each patient the greatest possible benefits from medical skill and science. To attain this end further, the organized medical staff adopts certain rules and regulations. Standards of education, of training, and of practice are established. These determine in good measure the composition of the medical staff and the results which they obtain. Because the hospital as an institution and its professional staff as an organization assume obligations to the patients cared for, the authors believe that requiring the approval of a committee of physicians is a justifiable and desirable means of controlling the performance of therapeutic abortions and sterilizations.

Particular emphasis has been placed upon the legal aspects of sterilization. This was done, in part, to elucidate one phase of the total problem and to indicate some difficulties a physician might encounter. Committee control over the procedure eliminates many of these difficulties. A thoughtfully appointed committee whose members remain anonymous is in a position to examine each case in terms of its fundamental necessity and to give a totally unhampered opinion with complete medical honesty. Aided by the hospital's legal adviser the committee can be familiar with the abstruse provisions of existing statutes, thereby offering protection against legal liability. When composed of qualified specialists the committee will possess detailed knowledge of the proper management of the various complications which arise during the reproductive years, thereby assuring conformance to the best in contemporary medical practice. With the realization of the importance of

its decisions the committee will conduct its deliberations on a high ethical plane, thereby avoiding the imputation of immorality to the procedures it approves. Thus the attending physician can be certain that any abortion or sterilization which he may do with the committee's approval will be legally defensible, medically indicated, and morally acceptable. (Am. J. Obst. & Gynec., August '50, H. A. Pearse and H. A. Ott)

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Sponge Biopsy--A New Method in the Diagnosis of Cancer: Sponge biopsy, a new method in cancer diagnosis, is performed by firmly rubbing a suitable sponge (e.g., gelatin or cellulose) over the accessible ulcer or mucous membrane. The sponge, well soaked in tissue juice, suspended cells, and particles of tissue is fixed in formalin (10 percent) embedded in paraffin, cut, and routinely stained prior to microscopic examination by the pathologist. Ulcers of the palate, gums, cheek, etc. have been proved cancerous by sponge biopsy, confirmed by surgical biopsy. Similarly, ulcers of the skin were diagnosed as epidermoid carcinoma, metastatic carcinoma, and basal cell tumors. In the rectum, sponge biopsy easily demonstrates the presence of malignant tissue, occasionally even when the surgical biopsy is falsely negative. Among 641 women sponge biopsy revealed 16 cancers of the cervix, 9 with symptoms, 7 without sign or symptom.

Sponge biopsy provides a simple and effective method for the procurement and processing of very small tissue particles preparatory to microscopic examination. It facilitates the demonstration of the presence of cancerous tissue in small ulcers at an early stage of cancer, when the disease may be successfully treated. (V. Congrès International du Cancer, 1950, S. A. Gladstone)

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Evaluation of Newer Drugs in the Treatment of Otitis Externa: Infections of the external ear constitute from 5 to 40 percent of all the cases seen in the otologist's office. Susceptibility to infection may be caused by the predisposing factors of moisture with maceration of the skin, absence of cerumen, and the accumulation of dead keratinized horny tissue, with the neutralization of the antibacterial acid cloak. The pH of the cerumen and the skin of the canal, which is normally acid, is of special importance. In healthy ears the pH lies chiefly within the acid range. This acid reaction, produced by the combined effect of the cerumen and the cornified horny cells of the surface of the skin, exerts a pronounced defense against bacterial growth. The pH of the ear can be determined by inserting a strip of nitrazine paper or alkacid paper into its lumen and comparing the produced color change with the standard color chart. This method lacks the precision of more elaborate procedures, but it is practical and adaptable to clinical conditions. Investigation of pH of the discharge from the external auditory canal in patients with



external otitis showed that in 98 percent of all patients examined the secretion was well within the alkaline range. These results seem to confirm the fact that the normal acidity of the canal is altered in fungoid and bacterial infections.

The symptoms of infection in the external auditory canal are varied, depending on whether the outer layer of skin alone is involved or whether the involvement includes also the underlying structure. Itching is an early and prominent symptom in both bacterial and fungoid infections. Pain is present in the ear in advanced cases and ranges from soreness to severe aching, the particular complaint of pain occurring with mastication. A sense of fullness in the ear with diminished hearing is also a frequent symptom.

Examination was made in a series of 168 office patients comprising 252 ears. Cultures were taken under conditions of careful asepsis. The external auditory canal was cleaned in the outer part with 95 percent alcohol. A sterile swab was carefully inserted as deeply as possible into the external auditory canal and then streaked on three mediums: Sabouraud's medium, dextrose broth, and Littman's oxgall agar. Littman's oxgall agar is a new culture medium used primarily for the isolation of fungi; it is neutral in reaction and has promise as a diagnostic tool in the isolation of molds. The medium has particular value in specimens with mixed bacterial and fungoid flora. Slide cultures were of value in studying the cultural characteristics and establishing the identity of the molds. The slide cultures are made by placing a cover glass on strips of melted sealing wax or dental molding compound applied to an ordinary glass slide and allowing it to cool. This procedure seals the cover glass into position with a space between it and the slide, into which the material to be grown can be inserted with a pipet. It is important that the material be mixed thoroughly with the melted culture medium and introduced into the space between the cover slip and the slide, filling approximately one-half the space. It can then be incubated in a moist chamber, permitting the growth that takes place on the free edge to be examined microscopically.

It is noteworthy that Gram-negative bacilli (Pseudomonas aeruginosa) are the etiologic agents in the majority of instances of external otitis caused by infections; the molds are of secondary importance. Staphylococci should also be placed high on the list of pathogenic organisms producing inflammation in the ear.

An attempt was made not only to study the clinical effects of some of the newer drugs, but also to assay them culturally. Among the drugs studied in vitro were: (1) sulfonamide powder (a combination of sulfathiazole, sulfadiazine and sulfanilamide); (2) metacresylacetate (cresatin-Sulzberger); (3) coparaffinate (Iso-Par); (4) sulfamylon (4-(aminomethyl) benzene sulfonamide hydrochloride) with streptomycin; (5) dibromosalicylaldehyde (dalyde); and (6) nitrofurazone (furacin). For local chemotherapy a drug should be nontoxic, without irritation of tissue, and with a wide range of bactericidal and fungicidal activity. Unfortunately, none of the drugs here mentioned have all these qualities.

Senturia and associates emphasized the importance of having an oxidizing substance to activate the sulfonamides in local applications and to augment the formation of hydrogen peroxide. He stated that sulfanilamide has specific fungicidal action, whereas the other sulfonamides exert direct action on bacteria. This statement has been borne out in practice; a light coating of the sulfonamide powders is recommended for frequent recurrence of fungoid or bacterial infection in the ear.

Coparaffinate (Iso-Par) is an excellent fungicide; it has a pH of 5.7, which definitely places it in the acid range, thus assisting in the reestablishing of the acid mantle in the ear. The bactericidal action of this preparation is slight, but it does possess some antipruritic properties. Many patients complain of its objectionable odor.

Dibromosalicylaldehyde (dalyde) is effective against fungi and Ps. aeruginosa. However, because it has a pH of 8.0 to 8.2, it will not assist in changing the skin to the acid side.

Sulfamylon with streptomycin has a pH of 4.8 in a 5 percent solution which shifts the skin surface to the acid range. It is efficacious against Ps. aeruginosa infection but has a negligible effect on molds. It has a high bacteriostatic potency because of the sulfur in the benzene ring and has a protracted efficiency in the presence of blood, pus, and inflamed tissue.

Metacresylacetate must still occupy a high place on the list of therapeutic agents used in otitis externa; it is fungicidal and exerts bactericidal effect on the Pseudomonas group. Its pH of 5.4 aids in reestablishing the acid cloak.

Nitrofurazone is slightly effective in vitro against penicillia and staphylococci but has no effect on other fungi; the pH of this preparation has not been established.

Thus, of the newer preparations that have been investigated, dibromosalicylaldehyde and 5 percent sulfamylon with streptomycin seem to be most worthy of mention.

The basic principles of treatment should not be altered by the use of newer drugs. Careful and painstaking cleansing of the canal is still most important, and the use of a drug that will combat the infection and allay pain is the prime requisite in treatment. Determining the pH of the canal of the ear will assist in choosing the drug to be used. The maintenance of dryness in the external auditory canal is the keynote to success in preventing recurrence. (Arch. Otolaryng., July '50, E.K. Gill)

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Migrainoid Headaches (Their Ocular Manifestations): Headache is unquestionably the commonest and one of the most distressing ailments within the entire



realm of medicine and paradoxically is one of the least well understood. It has usually been considered an annoying accompaniment of many and diverse derangements of the human body and its descriptions and analyses have been largely clinical and little concerned with its causative processes. Examination of many thousands of inductees at the Boston Induction Station in World War II revealed that headache was the most frequent bodily complaint and that in over 50 percent of persons unfit for the Service headache was the chief complaint. The implications of this symptom may be serious or benign and although the intensity of the headache may bear little relation to actual tissue injury, failure to distinguish between the severe headache of subdural hemorrhage, cerebral abscess, brain tumor, meningitis, or fever and the vast majority of head pains which spring from reversible body changes and psychologic and emotional episodes may have needless consequences and even endanger life itself.

The author, an ophthalmologist, after seeing many patients with the typical so-called migraine syndrome, became interested in the condition and in why this widespread symptom complex should in many instances involve the eye.

Four rather clear-cut syndromes, having characteristics resembling the migraine syndrome, are discussed:

1. Histamine Headache. This is generally a unilateral headache, usually beginning in the later decades of life, of short duration, commonly lasting less than 1 hour, and appears frequently at night, 1 or 2 hours after the patient retires. It has no hereditary background. It is associated with profuse lacrimation and congestion of the eye on the same side and accompanied by stuffiness of the nostrils and oftentimes swelling of the temporal vessels of the involved side. There is no associated nausea, vomiting, or visual disturbance. Pain is the outstanding complaint; it is constant, excruciating and boring, involving the eye, the temple, the neck and often the face. The pain has a tendency to conform to the ramifications of the external carotid artery and differs from trigeminal neuralgia in not being related to the distribution of any cranial nerve. Pressure on the external carotid artery on the same side often gives relief. The pain sometimes is precipitated by the ingestion of alcohol. Horton induced the typical head pain in 35 of 72 patients by injecting 0.1 to 1.2 mg. of histamine subcutaneously. The patients were never able to distinguish between the induced and the spontaneous attack and it was never possible to induce such attacks by giving histamine injections to normal persons. The author believes that histamine headache is very similar to true migraine headache. Desensitization by repeated small doses of histamine diphosphate has been advocated as the treatment for this condition, even though no specific allergy or hypersensitive state has been demonstrated.

2. Headache Associated with Muscle Ischemia. This type of headache is described as a type of pain referred to various parts of the head from localized painful areas in the muscles of the head and neck. It resembles to a degree the head pain present in migraine; it occurs after the 3d decade of life, with onset often following



acute infection; and is precipitated by exposure to physical stimuli such as drafts, changes in temperature or changes in atmospheric pressure. The pain is deep, not throbbing or sharp, and accompanied with localized areas of tenderness in certain muscles attached to the cranial bones. This myalgia is accompanied with a neuralgia usually involving branches of the 5th cranial nerve on the same side and in some patients vasodilatation, tinnitus, and vertigo have developed. It is possible that muscle ischemia, probably induced by spasm of the head and neck muscles, is a factor in this pain. Intramuscular injections of nicotinic acid for 2 to 3 months followed by oral administration of the drug gave complete relief in 54 of 72 patients.

3. Headache Associated with Hypoglycemia. This syndrome has occurred in patients who had typical hemicrania and in some instances a rather characteristic aura which resembled migraine closely and which on careful investigation seemed to occur at a period during the day when the blood sugar was at a very low level. This condition has been called hypoglycemic headache or headache due to hyperinsulinism. A definite connection appeared to be present between the blood sugar level and the beginning of the attack. Frequent feedings of certain food prevented the attacks, while they could be precipitated by hypoglycemia induced with insulin.

4. Vascular Headache. In this syndrome, described by Alpers and Schlezinger, the type of head pain was not different from that encountered in any type of the so-called vascular headache. The distinguishing feature was the presence of isolated extraocular paralysis which in most cases involved the 3d or 4th cranial nerve and in reported cases indicated an aneurysm of the posterior communicating artery, demonstrated by arteriography. These authors stated the belief that such aneurysms, being small, constituted a favorable type for ligation, and successful operative procedures were reported in 5 of 7 patients. (Arch. Ophth., August '50, H. C. Donahue)

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The Experimental Use of Cortisone in Inflammatory Eye Disease: Inflammatory disease of the eye is frequently treated with artificial fever, usually provoked by parenteral foreign protein. In a previous paper, the authors suggested that the therapeutic benefits are derived from an acceleration of mechanisms normally evoked in many acute stress states. In this respect, the results of many investigators have been such as to ascribe a basic role to the pituitary-adrenal system. Indeed, Sayers and Sayers have shown in the experimental animal that both heat and injected killed-typhoid organisms produce changes in the adrenal cortex which are characteristic of the response to stress. Talbot et al. and Venning et al. have shown that, following a variety of stress states, there is a pronounced increase in the urinary excretion of 11-oxycorticosteroid-like material. A similar increased excretion in human beings has been demonstrated by Forsham et al., Mason et al., and Sprague et al., following the administration of pituitary adrenocorticotropin. It has been postulated by Selye and Albright that the response to stress is achieved to a great extent through an increased elaboration of the adrenal 11-oxycorticosteroids.



In the previous report, which concerned the experimental use of adrenocorticotrophic hormone (ACTH) in the treatment of inflammatory eye disease, the authors presented results which equalled or exceeded those obtained with present-day methods of therapy. It is felt that this was achieved by an adrenal response through stimulation from the injected ACTH which surpassed the physiologic response to fever-induced stress. On the premise that the released 11-oxycorticosteroids were the active principles effecting these changes, it seemed logical to determine whether or not this group of steroids administered directly would produce results comparable to those achieved with ACTH.

Other theoretic considerations existed for the trial of 11-oxycorticosteroids in the treatment of ocular disease. It is apparent that ACTH would benefit only those who had adequate adrenal response. Moreover, a few undesirable features may be encountered with ACTH which might be avoided by the use of an 11-oxycorticosteroid. In particular, this would apply to patients with certain types of cardiovascular disease, who might not tolerate the effects of either fever therapy or the prolonged injection of the pituitary hormone.

Recognizing the limitations of our knowledge of corneal permeability, it might be possible for these steroids to act directly upon corneal lesions. Furthermore, minute quantities might be absorbed into the anterior chamber to influence favorably inflammatory lesions involving this segment of the eye. Cortisone was used in a series similar to that previously treated with ACTH; sufficient observations were made on 7 patients to justify the present report.

The 7 patients were drawn from the outpatient clinic of the Henry Ford Hospital. Six of the patients were hospitalized for complete physical examinations and detailed ophthalmologic studies. Plastic iritis, luetic keratitis, retinitis centralis, central scotoma, acute iritis, and keratitis with secondary anterior uveitis were encountered in the patient group. Five patients were hospitalized for parenteral cortisone, 1 patient received topical cortisone both during and after hospitalization, and 1 patient, treated as an outpatient, followed the program of local administration as carried out in the hospital. Except for dilatation with either atropine or homatropine the patients received no definitive therapy during hormone treatment. Cortisone acetate was administered intramuscularly with initial dosage of 50 mg. every 4 hours. As the patient responded, the same dosage was given at increasingly longer intervals or was reduced to 25 mg. every 4 hours. Total dosage of parenteral cortisone acetate ranged from 425 mg. in 1 patient to 2,450 mg. in another. In general, the patients on parenteral cortisone experienced the same sense of well-being as observed in those receiving ACTH. No complications were observed. The therapeutic action of parenteral cortisone was reflected in the rapid and objective improvements which occurred, manifested by complete relief from pain and from photophobia. In the 2 patients given topical cortisone, 1 had developed severe keratitis and secondary anterior uveitis, and the other corneal edema, anterior uveitis and a secondary glaucoma. The drug was given in 1 to 2 drop instillations every hour

at the beginning of treatment; the regime was then varied. Marked improvement was present in the 1st case in 1 week; and in the 2d case, after 48 hours' treatment, marked improvement had occurred. In the 1 case of luetic keratitis reported, the results of topical application could not be evaluated. Since this patient had also received ACTH prior to administration of cortisone, it is possible that the lesion might have cleared had ACTH been continued longer, or the improvement following topical cortisone may have represented a delayed beneficial response to parenteral cortisone.

The data seemed to demonstrate that parenteral 11-dehydro-17-hydroxycorticosterone acetate (cortisone acetate) is effective in resolving certain inflammatory diseases of the eye, despite the limited number of cases that were studied. Cortisone causes a more rapid resolution of these lesions than does foreign-protein therapy. It should be pointed out that the therapeutic benefits derived from cortisone do not justify omission of the time-honored search for the possible etiologic factors in ocular inflammatory disease. It may be postulated that certain inflammatory eye diseases are a direct reflection of altered adrenal physiology of the individual under prolonged stress, and possibly of the individual with a relative adrenal-cortical hypofunction as well. If this postulate proves true, cortisone would appear to have a more specific role in therapy.

Another possible advantage of this agent is the fact that control of certain inflammatory lesions can be effected in a few hours, as contrasted to the time that is frequently required with current methods of therapy. In addition, patients receiving cortisone in this study did not demonstrate any side effects. The brief treatment time in most cases may have obviated in part the possible undesirable complications.

At the present time cortisone and ACTH appear to be equally effective in the treatment of certain inflammatory eye diseases. Further experience may delineate more selective application for each. The direct action of cortisone may be preferable for patients in whom the use of either fever therapy or ACTH may be limited, as, for example, patients with hypertension, congestive failure, or advanced, degenerative renal disease. Other patients with insufficient adrenal reserve may not respond adequately to fever or to ACTH.

Because the patients treated with topical cortisone alone showed a definite and favorable response, cortisone may act directly at the local tissue level and also penetrate the cornea in amounts sufficient to alter favorably inflammations of the anterior segment of the eye. The favorable response of acute inflammatory lesions to cortisone reported here in no way suggests that future relapses will be prevented.

The observations reported lend support to the concept that cortisone, and possibly other steroids with similar physiologic activity, are of importance in the response of the organisms to inflammatory processes. This limited series does not



allow any broad conclusions as to the efficacy of cortisone in other eye diseases. Its broader application is currently under investigation. (Am. J. Ophth., July '50, E. H. Steffensen et al.)

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Cortisone and ACTH in Clinical Medicine: It is not possible to summarize briefly the extensive clinical investigations with cortisone and ACTH which have been carried out in the Mayo Clinic during the past year. However, some points seem to stand out with reasonable certainty.

First, it is clearly apparent that observations on the beneficial effects of these agents in certain nonhormonal diseases constitute an important medical advance. Up to the present time, the importance of this advance rests chiefly upon the initial physiologic observation of the rapid reversibility of rheumatoid arthritis and acute rheumatic fever under the influence of these hormones and, subsequently, the reversibility of a variety of other conditions. How far this fundamental observation will extend into the realm of medical therapy remains to be demonstrated.

Second, it is now apparent that the diseases which are favorably modified by cortisone and ACTH are not cured by them. This is most dramatically illustrated by acute leukemia, some cases of which go into a more or less complete remission during and for a short time following administration of the hormones, only to relapse again and terminate in death.

Third, as has been stated repeatedly, cortisone and ACTH are powerful hormonal agents which are capable of inducing a wide variety of physiologic or pharmacologic alterations. Some of these alterations have favorable therapeutic implications, others are relatively unimportant, while still others may impose hazard upon the patient. Unfortunately, there may be no distinct line of demarcation between favorable therapeutic effects, on the one hand, and other physiologic effects, some of them undesirable, on the other.

Furthermore, in most of the clinical conditions which have been favorably influenced by administration of these hormones, there is no clear evidence of hormonal deficiency. (Exceptions to this are conditions of frank adrenal cortical insufficiency, such as Addison's disease.) Consequently, it appears that in many of these conditions a state of hormonal excess must be created in order to achieve therapeutic benefit. If this state is of sufficient degree and duration, a variety of physiologic effects, desirable and undesirable, may make their appearance. Thus, it becomes necessary to find ways and means of dissociating the beneficial therapeutic effects of the hormones from their other physiologic effects. Whether such dissociation can be achieved in conditions requiring prolonged administration by adjustment of dosage, by interrupted periods of administration, or by other means, remains to be seen.

At the present time the conclusion seems inescapable that the therapeutic application of these hormones has not yet been sufficiently extensive to permit an appraisal of their place in practical therapeutics, particularly in diseases which follow a chronic course. However, it should be noted that encouraging reports of prolonged administration of small maintenance doses to patients with rheumatoid arthritis are beginning to appear. In more acute or self-limited conditions, of which rheumatic fever and some allergic states seem to be outstanding examples, the therapeutic utility of these hormones seems to rest on more secure ground. In such conditions, it may be possible to take advantage of the favorable effects of these agents without encountering the undesirable effects which may result from prolonged administration. In the case of acute rheumatic fever, qualification is again necessary, however, for it has not yet been established with certainty that the hormones will prevent the development and progression of the lesions of rheumatic carditis.

It should be noted that the areas of possible therapeutic usefulness of cortisone and ACTH are becoming more clearly defined. The era of therapeutic trial of these agents in a wide variety of seemingly unrelated conditions is drawing to a close. It is beginning to appear that the so-called collagen diseases and a variety of allergic or hypersensitive states are conditions in which these hormones offer the greatest therapeutic promise. To what extent unwanted physiologic effects will limit the usefulness of these agents in the management of chronic diseases will be revealed by more extensive clinical experience. (Proc. Staff Meet., Mayo Clinic, 16 August '50, R. G. Sprague)

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#### Permanent Camouflage of Corneal Scars Using Insoluble Tattoo Pigments:

The corneal transplant operation (keratoplasty) is successful in only a limited number of cases, because most cases of blindness are due to causes other than corneal scars. When the corneal opacity is not amenable to such operation because of excessive density of the scar or pronounced superficial vascularization which would render the transplant nebulous or opaque, the patient can best be helped by relief or correction of his conspicuous deformity. Accordingly, the authors developed, about 3 and 1/2 years ago, a technic to camouflage corneal scars permanently by injecting insoluble pigments. They believe that tattooing, alone or combined with iridectomy, is the procedure of choice in cases of corneal scarring.

Tattooing may improve visual acuity by reducing the area of an abnormal cornea through which dispersing pencils of light pass. By tattooing a central corneal opacity encroaching upon the pupillary area, but not completely occluding it, one creates a condition comparable to a contracted pupil. Increased light may result, since some of the annoying peripheral rays are obstructed. Instead of developing spherical aberration, with consequent reduced visual acuity, these rays are absorbed.



The Technic of Tattooing Corneal Scars. Preoperative Plan. In adults, the operation may be performed with either local or general anesthesia. In children, however, general anesthesia is preferable. Holocaine, pontocaine, and butacaine will produce a relatively quick local anesthesia without softening of the corneal epithelium and without affecting the size of the pupil. While cocaine will produce satisfactory local anesthesia, it softens markedly the corneal epithelium and dilates the pupil.

Sodium pentothal will not cause any change in the size of the pupil during induction, unless there is a painful or exciting stimulus, in which event the pupil will dilate. When the 2d plane of the surgical stage of anesthesia is produced with pentothal, the pupils are slightly constricted. During this phase (the level of anesthesia for tattooing the cornea) very painful stimuli or anoxia will cause some dilatation of the pupil. During induction of anesthesia with ether, there is some dilatation of the pupils because of the liberation of adrenalin. During the 2d plane of surgical anesthesia with ether the pupils are essentially normal. Painful stimuli will produce little effect on the pupillary size because it blocks the afferent limb of the reflex arc. In the 3d plane of surgical anesthesia, dilation of the pupils occurs because the pupillary muscles are paralyzed.

The size of the pupil should be that of the normal pupillary opening under ordinary lighting conditions. A diameter of 4 mm. is a pleasing size. The pupil size should be determined prior to operation, since the anesthetic agent or the intense illumination of the operating room will cause variability in the pupillary size. The size of the iris is determined by careful measurement with dividers as compared with the normal eye.

Operation. The instruments are sterilized by boiling. The pigments are autoclaved and stored in stoppered Wassermann tubes.

First Stage. After satisfactory anesthesia has been obtained, a speculum is inserted into each orbit to visualize both eyes simultaneously. The eye to be tattooed is effectively immobilized with mosquito clamps or lock forceps which grasp the conjunctiva at 3 and 9 o'clock. They are placed about midway between the limbus and each canthus. Since the clamps may cause tiny perforations or serrations in the conjunctiva, they are not released until the termination of the operation in order to prevent the possibility of pigment entering the clear areas of the conjunctiva.

The size of the pupil and iris, which was determined previously, is now rechecked by careful measurement, with dividers, of these structures on the normal side. The basic color of the iris is obtained by mixing several dry pigments in a porcelain palette and adding saline solution until the consistency of a thin paste is obtained. A small amount of mixed pigment is then spread thinly on the gloved finger and compared with the color of the iris on the normal side. This basic color should be slightly darker than the normal iris. Then using a No. 1 or No. 2 tattoo



needle, the periphery of the cornea or limbus to be tattooed is outlined with the basic color pigment. Meticulous care should be exercised in defining this border. The implantation of pigment should begin at the limbus, working toward the center of the eye in a radial direction. The operator may find it advantageous to change his position occasionally from the sides to the head end of the table, rather than to rotate the eye. The injection of the pigment from the periphery to the center will assimilate quite accurately the normal striation of the iris. It is important to insert the needle at any angle of from  $45^{\circ}$  to  $60^{\circ}$  so that a line of pigment rather than a tiny spot in or beneath the epithelium will be produced. Iris color tone is then added using a No. 3 tattoo needle in a radial fashion until the scarred area is quite homogeneous in color. Any pigment which encroaches upon the pupillary area will subsequently be covered by black. Care should be taken to avoid entering the anterior chamber. The cornea will tolerate a rather surprising amount of trauma and one need not cease injection of the pigment until the cornea is quite "chewed up," unless one is tattooing a conical cornea, in which case one should proceed with caution, to avoid entering the anterior chamber with possible resultant collapse of the globe. The eye is flushed frequently with saline solution then wiped dry very gently with wisps of cotton or applicators. Any visible areas of scarring are then tattooed until the iris color is quite homogeneous.

The pupil is inserted in the following manner: Using a Keyes cutaneous punch or a corneal trephine, of the size corresponding to that of the predetermined pupillary measurement, a circular incision is made in the cornea to define the limits and the periphery of the pupil. This corneal trough is made by rotating the instrument in a to-and-fro motion. Care is exercised to avoid incising the cornea deeper than about 1 mm. Into this circumscribed area, concentrated black pigment is injected. The appearance of the eye to this point will seem to lack luster. However, after the pupil has been inserted, a very pleasing appearance results, which should resemble that of the normal eye. Definite brilliance and sparkle are obtained by inserting flecks of orange, yellow, blue, green, or brown.

The eye is flushed with saline solution using a bulb or ear syringe to wash away all excess pigment. The eye is wiped dry with cotton wisps, following which petrolatum or penicillin ophthalmic ointment is placed in the eye before the clamps and speculum are released. The eye which has been tattooed, and sometimes both eyes, are covered with a small gauze dressing. The authors have accomplished tattooing in a single operation only when the scar was small or involved only part of the iris.

Postoperative Phase. Following operation, patients may experience varying degrees of photophobia. If this is pronounced, they are placed in a darkened room. Dark sun glasses will frequently bring relief. Pain is not pronounced. A local anesthetic agent has not been instilled into the eye following operation. Although there is some injection of the eye for about 1 week, discomfort is usually not present after the 1st or 2 day. About 1/2 of the patients are discharged from the



hospital on the 2d or 3d postoperative day, to be followed on an ambulatory basis for about 1 week or 10 days when the eye is ready for the next stage of the injection of pigment.

Second Stage. When the scar is not small, a second stage is often necessary, not because of fading, but rather because of an insufficient number of minute injections made at the first operation. In the second operation, additional iris and pupil tone are added, so that no areas remain which do not contain pigment. If the operator is satisfied that the basic iris color is well matched with the opposite eye and that there are no areas of untattooed scar visible, the iris is flecked with orange, yellow, blue, green, red, or brown to match accurately the sparkle colors of the normal eye. The limbus or the periphery of the iris is a diffused, circular, blue-gray line. This effect may be produced by tattooing the periphery with blue pigment to which black has been added. In many instances, a light zone of pigmentation surrounds the pupillary area. This effect can be achieved by injecting the rim of the pupil with a light pigment.

Only rarely is a 3d or 4th tattooing necessary. If a touch-up procedure is required to perfect the camouflage and to make both eyes objectively the same, a period of 4 to 6 weeks should elapse following the last procedure whether the previous operation was a tattooing or muscle imbalance operation. (Surgery, August '50, K. L. Pickrell et al.)

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Common Problems in Coronary Artery Disease: The topic at hand is a complex one. Despite all technical advances, the history is still the sine qua non in diagnosis. Pain is the cardinal symptom; it is ischemic in type and has the same characteristics as ischemic pain elsewhere. The most characteristic feature of this pain is its relation to stress, except when infarction has occurred, which in most instances occurs while at rest.

The pain of ischemia is not usually related to motion as such or to respiration or posture. It is characteristically substernal with or without radiation to the shoulders, the ulnar nerve distribution in the arms, the back, the jaws, and the epigastrium. The left shoulder and arm are the commonest sites of radiation, while extension into the neck or jaw is considered practically pathognomonic. Cases without substernal element are rarely seen, although this factor may be ignored in the presence of significant pain at one of the sites of radiation. Occasionally the only manifestation is high left precordial or axillary pain, which is of definite significance in the absence of local tenderness and when the relation to stress is perceived. Localized periapical pain is extremely rare except in psychosomatic disorders or perhaps in pericarditis.

The character or quality of the pain is fairly constant, though variously described as crushing, burning, tearing, etc.; the predominant element seems to be one of pressure, which might best be recalled by the picture of a man who was once seen by one of the authors immediately after a myocardial infarction. The patient was stretched over the back of the seat of the car and his hands still grasped the lapels of his coat and shirt, and the loosened buttons gave mute testimony of his attempt to relieve the sense of pressure. The severity and duration of the pain roughly parallel the degree and duration of the ischemia and serve as an useful index of the changes resultant from ischemia. Two useful but frequently overlooked points in the analysis of pain when infarction has occurred are (1) its wave-like qualities, and (2) the restless attempt of the patient with infarction to "get away" from his pain.

A significant exception is coronary artery disease in the Negro. It has been repeatedly stated that angina does not occur in the Negro and statistically is rare. This has been explained as an inability to feel or to express pain on the part of the Negro, but there is little evidence to support this contention. On the other hand, Hunter has theorized that the lack of pain is due to the earlier onset and greater severity of hypertension in the Negro race with its concomitant dilatation of the coronary collaterals. In the same paper Hunter has shown that the Negro most frequently manifests his myocardial infarction by the sudden onset of dyspnea or the sudden increase in an already existing dyspnea, and this has been confirmed by Libman who describes such symptoms under the title of "substitution symptoms." Under this title he has also placed such symptoms as dizziness, fatigue, vertigo, nausea, vomiting, palpitation, syncope, etc., and he explains such manifestations on the basis of an increased threshold to pain. Carefully observing these symptoms, Kugel noted that up to 97 percent of all patients with myocardial infarction manifested pain or one of its substitutes.

Having once determined, largely by history, the presence of myocardial ischemia, the evaluation of its consequences proceeds by physical examination, the electrocardiogram, and possibly by roentgenkymography. In regard to physical examination it is to be noted that despite the "radical drop" in blood pressure of the texts, the man on the spot seldom sees this early, but rather a normal or elevated blood pressure which, however, is extremely labile on frequent determinations. A significant drop may not occur for 24 hours or more.

Treatment of pain is a primary consideration. Morphine in physiologic doses and demerol are standard drugs. Gold stresses the fact that the dose of morphine is 1/6 gr. If pain is extreme and appears to be leading to shock, there seems to be no valid objection to careful intravenous administration of morphine. However, in the presence of cor pulmonale, marked pulmonary emphysema, asthma, or a kyphoscoliotic chest, morphine must be avoided and demerol should be substituted. Oxygen, if available, is an extremely valuable adjunct as is reassurance, if possible.



The intravenous use of papaverine has its advocates, but its physiologic action is evanescent and reactions are not rare. Atropine and large doses of xanthines, though useful in the tremendous doses used in animal experimentation, seem to have no effects in the small doses tolerated by man. In the initial phases opiates for pain and sedatives for restlessness and apprehension are safe standards. Xanthines by mouth have no proved effect and cause nausea even in well persons.

In the rare case complicated by acute left ventricular failure, rapid digitalization and use of mercurials is indicated; in the usual case with auscultatory findings indicating basal pulmonary edema and mild respiratory difficulty, the mercurials alone are usually effective and perhaps safer. Routine use of quinidine for prevention of arrhythmias appears to have no disadvantages and is indicated where there is evidence of ventricular irritability.

The brilliant work of Prinzmetal, which has shown that if pressure is maintained in the sinuses of Valvula, almost any degree of arterial occlusion can be survived, appears to offer new hope in those highly fatal cases in which shock ensues. Thus far, attempts to maintain this pressure by intravenous fluids and transfusions have been of little avail; perhaps intra-arterial transfusions and pressure suits will be the answer.

Bed rest depends on the estimate of the size of the infarction, as aided by clinical, laboratory, and electrocardiographic methods, and the presence or absence of collateral circulation as judged largely by age and history. In the relatively young patient with a large initial infarction maximal bed rest for 6 weeks or more is indicated; in old patients or those having repeated infarctions, the areas are usually smaller in those who survive and collateral circulation seems better; thus 2 or 3 weeks are often adequate.

The apparently impressive reduction in mortality (13 percent) revealed in Wright's monumental survey of the effects of anticoagulants, although factual, demands critical individual evaluation. Its use is contraindicated in any case in which there is uncertainty as to its safety by reason of inadequate laboratory control, history of bleeding, suspicion of or proof of hepatic insufficiency, or potential sources of bleeding, e.g. peptic ulcer. There appears to be no justification for the emergency use of dicumarol, even though some believe its efficacy lies in its spasmolytic action upon the coronaries. One is always justified in obtaining baseline prothrombin levels and in delay for clinical appraisal. The interval use of heparin is in most cases optional. Dicumarol probably has its maximal efficacy in those cases in which there is an element of congestive heart failure, with attendant slowing of circulation time, venous stasis, and chronic hypoxia, i.e. the more severe cases. In those cases in which its use is not feasible, or in those in which its use is decided against for other valid reasons, there seems at present to be no reason why comparable results cannot be obtained by measures directed against thrombo-embolic phenomena by other means. The use of anticoagulants is

therefore most strongly indicated in those cases in which there is an element of congestive heart failure and in which, by reason of continued, otherwise unexplained fever, suspicion of a large mural thrombus arises. Anticoagulants should be continued for a period of 4 to 6 weeks according to the indications for their use.

After Care. The authors' criteria for rehabilitation are their estimate by clinical and electrocardiographic means of adequacy of initial healing, their estimate of cardiac reserve by performance, and the confidence of the patient. In spite of the fact that return of electrocardiographic changes towards normal continues at times for a year or more, one must bear in mind that for the average patient anxiety over the future and his financial security or lack of it may impose a far greater strain upon the circulation than the quiet performance of remunerative but not strenuous work. One should have no guide but an honest and well-considered opinion as to what seems best for the individual and his family. One should know the patient well enough to be able to determine whether or not he is one of that large group of individuals with organic heart disease whose personality pattern is such that anxiety is met with increased cardiac output, and to determine in which direction the sources of that anxiety lie. (Postgrad. Med., September '50, S. N. Jones and T. F. Keliher) (See also Medical News Letter, Vol. 15, No. 6, p. 2, and Vol. 15, No. 7, p. 11.)

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Hemophilia Simulating Acute Surgical Abdomen: Hemophilia is an hereditary disease characterized by an abnormally long coagulation time. Although considered a rare disease, it is the most common of the congenital hemorrhagic diseases, and the fact that the hemophiliac patient requires numerous hospital admissions during his lifetime makes hemophilia a fairly common disease in general hospital practice.

Hemorrhages of hemophilia may occur spontaneously; usually they follow trauma. The trauma may be so slight that the patient scarcely remembers it at the time his symptoms appear, and the extent of the hemorrhage may be far greater than would be expected with the amount of trauma. Characteristically, the bleeding of hemophilia is into the deep structures: muscles, bones, joints. This may help distinguish hemophilia from other hemorrhagic diseases, such as thrombopenic purpura, in which the bleeding is often an oozing from the mucous membranes.

The hemorrhages of hemophilia may occur in any location, and to distinguish the symptoms of hemorrhage from those of other diseases, which also occur in hemophiliacs in the same ration as in the general population, often requires astute clinical judgment. The most frequent site of bleeding in the adult hemophiliac is into the joints, and chronic hemophiliac joints have often been described in the literature. Pseudotumors of bone, especially of the hands and feet, are not uncommon. Epistaxis, laryngeal obstruction due to hematoma, hematuria, pleural and parenchymal lesions of the lung, and numerous neurologic lesions have also been described.



Intra-abdominal hemorrhage is one of the most serious forms of bleeding because of the high mortality which accompanies exploration in the hemophiliac who has not been prepared for surgery by adequate antihemophilia therapy, and also because of the complication of hemorrhage at the site of other acute disease, such as cholecystitis. The differential diagnosis is difficult. Lower abdominal pain is said to be the most frequent of all abdominal emergencies in hemophilia.

The most common sites of hemorrhages are in the colon wall or the mesocolon, where the signs are those of partial obstruction, and into the iliopsoas muscle, where the signs resemble those of acute appendicitis. The pain is usually in the right lower quadrant with hemorrhage into the iliopsoas. Although the pain seldom starts in the epigastrium, it may begin insidiously and become much more severe in 24 hours, with exquisite tenderness and rebound tenderness over McBurney's point. Rectal pain is usually more severe on the right side. Vomiting and cramping abdominal pain may occur. Low grade fever and a moderate leukocytosis are usually present. In 1 series of 40 hemophiliac patients followed for several years, 15 had had at least 1 episode of lower abdominal pain.

The authors report 2 cases demonstrating the difficulties that may be encountered in the management of lower abdominal pain in the hemophiliac patient. At the time of their admissions both of these patients were known to have hemophilia. The main problem was whether their symptoms were due to a bleeding episode or to acute appendicitis. In the first case, intra- and extra-luminal hemorrhage seemed most probable because of the tarry stools and coffee ground vomitus and signs of generalized peritoneal irritation. The treatment therefore was directed to correcting the coagulation defect. The rapid regression of symptoms substantiated the impression that intra-abdominal hemorrhage was the sole cause.

In the other case, within the first 14 hours after admission, the patient's clinical condition progressed unfavorably to such extent that surgical intervention appeared imperative. He was rapidly prepared for operation with antihemophilia globulin and the abdomen was explored as soon as the coagulation time approached normal. The diagnosis of intra-abdominal hemorrhage was established at operation, although the signs and symptoms were clinically those of acute appendicitis. The confusion of appendicitis and bleeding in hemophilia is so frequently encountered that Quick has stated, "It should be remembered that any sudden symptom appearing in a hemophiliac should be considered arising from hemorrhage until proven otherwise."

Quick has described the process of coagulation as autocatalytic, originating in the platelets, which upon disintegration liberate an enzyme which acts on the precursor of thromboplastin, thromboplastinogen, converting it to active form. Thromboplastin then reacts to form thrombin which in turn combines with fibrinogen to produce fibrin. Thrombin also causes labilization of platelets so that more enzyme is available.

The classical criteria for the diagnosis of hemophilia are a familial history of bleeding tendency, a personal history of bleeding, and a demonstrable increase in venous clotting time. To these might be added the return of the coagulation time toward normal after the administration of antihemophilia globulin. The diagnosis is usually established during childhood. Patients in the age group of 3 years to 10 years are most frequently hospitalized for acute hemorrhage, possibly because of physical hyperactivity. Approximately 70 percent of the patients give a familial history of a bleeding tendency.

Although the coagulation time of venous blood which is free of tissue juices is characteristically prolonged, mild hemophiliacs with normal coagulation times have been reported. The clot retraction time, Rumpel-Leedes test, bleeding time, platelets count, and prothrombin time are normal. However, it has been shown in hemophilia that the clotting time of recalcified plasma obtained by fast centrifugation is longer than the clotting time of recalcified plasma obtained by slow centrifugation, whereas the speed of centrifugation of the clotted blood has little effect on the clotting time of normal recalcified plasma.

The prothrombin consumption test (prothrombin time done 1 hour after a clot has appeared in unoxalated blood using fresh oxalated plasma treated with tricalcium phosphate as a source of fibrinogen) is usually 9 to 12 seconds in hemophilia, whereas the normal range is 16 to 30 seconds. These tests, while unnecessary in the classical case, have been used to establish the diagnosis when the cause of the bleeding tendency is obscure. (Postgrad. Med., September '50, M. Shelton and H. H. Hussey)

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The Influence of Microwave Diathermy on the Swelling and Trismus Resulting from Odontectomy: This study was carried out in order to observe and record as accurately as possible the degree of swelling and trismus which follows removal of impacted third molars and to evaluate the results of a new kind of heat treatment, microwave diathermy, which has been used on patients who have undergone odontectomy of the third molar. Until now, physical agents, such as heat and cold, have been used empirically to alleviate the postoperative symptoms.

The swelling that follows the surgical removal of an impacted third molar is due to the inflammatory edema which is produced by the outpouring into the tissues of intravascular fluid as a result of the action of irritants which increase the permeability of capillaries. The fluid produces a temporary thickening of the cheek and tissues contiguous to the third molar region. The cause of the trismus is not known. Probably, the direct action of the inflammatory exudate in and around some of the muscles of mastication is at least partially responsible.



The degree of swelling and trismus following odontectomy of third molars was studied in 35 patients. In order to determine the effect of microwave diathermy on the swelling and trismus, one side was exposed to microwaves and the other was left untreated after odontectomy of third molars. In these patients impacted third molars were situated bilaterally, but the removal was done one side at a time. The microwave diathermy used in all cases consisted in 20 minutes of continuous exposure to microwaves at an output of 100 watts when the director was at a distance of 5 cm. from the skin of the cheek. This treatment was given on the first 4 days after operation on only one side. Measurements indicative of swelling and trismus were made postoperatively on both sides of the jaw. When the averages of the measurements of the sides treated were compared with the averages of the sides not treated, the following facts were noted:

1. Swelling was less severe on the side that was exposed to microwaves than on the side not treated during the 2d, 3d, 4th, and 5th postoperative days.

2. Trismus was less severe on the 3d, 4th, and 5th postoperative days when the jaw was treated with microwaves following odontectomy than when no microwave diathermy was applied.

An additional comparative analysis was made in 19 of the 35 cases in which the data were complete and the extent of surgical procedures on 1 side of the jaw of each patient was nearly equal to that on the other side. In this group of patients the average severity of swelling and trismus was less after microwave irradiation than when no microwave diathermy was applied. It was found that the differences in the severity of swelling and trismus when treatment was given and when it was not given to these 19 patients were similar to the differences noted for the 35 patients.

An average rise in the intra-oral temperature of 0.9 degree (C.) was recorded on the lingual side of the mandible in 9 cases, and an average rise in temperature of 1.1 degree on the mucosa lateral to the site of extraction was recorded in 17 cases after microwave diathermy. (Arch. Phys. Med., September '50, R. Q. Royer et al.)

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Bilateral Renal Calculi: The management of bilateral renal calculi is always a perplexing problem. In searching for a better method of handling this problem 12 case histories were studied at the White Memorial Hospital and are reported at this time.

The majority of the patients were in the 3d, 4th, or 5th decade of life, the lesion rarely occurring in the 2d or 6th decade. Pain in the back brought about 85 percent of the patients to the hospital. The other patients sought relief from hematuria, dysuria, cloudy urine, or chills and fever. Ten of the 12 patients had had

attacks of back pain off and on for 5 to 14 years before admission; 1 patient had had intermittent hematuria with clots for 15 years; and 3 gave a history of previously passing kidney stones. Patients complaining of back pain were usually found to have tenderness at the costovertebral angle or anteriorly over the kidney area or both. Two patients were found to have a mass in the loin without tenderness.

Three patients had bilateral staghorn calculi; 3 patients had staghorn calculi on 1 side and stones in the kidney pelvis on the other. Of the other 6 patients, 4 had stones in the kidney over 1 cm. in diameter and 2 had stones less than 1 cm. in diameter. In addition 2 had obstructing ureteral calculi.

In 3 of the 12 patients both kidneys showed good function; in 1 patient function was good on 1 side and fair on the other; in 1 patient it was fair on 1 side and not good on the other; and 1 patient had no measurable function on either side. This latter patient had an obstructing ureteral calculus on 1 side and an extensive calculus pyonephrosis on the other.

The urine from most of the patients showed Gram-negative bacilli, pus and red blood cells; a lesser number showed Gram-positive cocci.

Eight of the 12 patients were operated upon for the relief of pain. Some had surgery for obstruction, infection, hematuria, or increasing hypertension as well. Of the 4 patients not operated upon, 3 were made symptom-free by chemotherapy, and are being further followed. Two patients had a ureterotomy for large obstructing calculi. In 1 the silent calculus was removed first because the better kidney was on this side. In the other patient the ureteral calculus was removed first because of pain on this side.

The surgical procedures consisted of 5 pyelolithotomies, 5 pyelonephrolithotomies, 1 pole-to-pole splitting of the kidney for staghorn calculus pyonephrosis and 2 ureterolithotomies; a nephropexy was performed upon 1 kidney after pyelolithotomy. One of the previously mentioned patients in an 8 year period underwent 3 pyelolithotomies on the right side and 2 pyelolithotomies on the left.

There were no serious postoperative complications. Chemotherapy was routinely given before and after surgery. Early ambulation was practiced when it was feasible, the patient getting out of bed on the 8th or 10th postoperative day. One patient went home on the 6th postoperative day. When a pyelostomy tube was used, it was removed about 10 days postoperatively.

In a pole-to-pole splitting of the kidney for staghorn calculus pyonephrosis, 1 hemostatic bag catheter was placed in the upper pole and another in the lower pole. Penicillin solution was used for irrigation. The catheters were removed on the 12th day and there was no leakage. One patient was moderately distended for the first 24 hours. This was relieved during the next 2 days. Secondary bleeding



on the 12th postoperative day in 1 patient was controlled by 3 blood transfusions. Two patients had a ureteral catheter inserted on the 12th postoperative day to aid the healing of the wound in the kidney pelvis following removal of the pyelostomy tube. In 1 case 8 months after removal of a staghorn calculus a perinephritic abscess developed. After drainage the patient made an uneventful recovery.

At times staghorn calculi with minimal infection are better left alone and the patient kept under observation. Each patient is an individual problem and the physician must carefully study the cystoscopic, x-ray, functional and laboratory findings. These facts must be weighed against the patient's age, physical condition, and symptoms before deciding on a course of treatment which will best serve the patient. (Am. J. Surg., September '50, C. W. Collings and I. E. Martin)

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Surgical Treatment of Varicocele: Varicocelectomy has long been an unsatisfactory surgical procedure, carrying with it numerous pitfalls. The classic procedure of dissection and excision of the distended veins in the scrotum is technically a difficult undertaking, often failing to relieve symptoms and frequently resulting in undesirable complications such as hemorrhage, atrophy of the testicle, and hydrocele formation. Therefore, many urologists and surgeons have been reluctant to advise operation in cases of symptomatic varicocele. One of the anatomic weaknesses of the male is the emptying of the left internal spermatic vein into the left renal vein at right angles. When the valves of the internal spermatic vein are incompetent, venous stasis in the pampiniform plexus results causing the scrotal veins to enlarge and the testicle to become more dependent. The incidence of this defect is high in the young male population. Most cases are without disabling symptoms; however, when discomfort and pain are present the condition often requires surgery for relief. The author reports a series of 10 cases in which all complained of a feeling of heaviness in the scrotum and a dull ache in the left groin made worse by increased physical exertion and most distressing in the afternoon and evening hours. All patients were given extensive trial with scrotal suspensories without relief before surgery was recommended.

When the circulation of the testicle and surrounding regions is thoroughly understood, the logical procedure is to relieve the back pressure caused by the anatomic weakness of the internal spermatic vein by the ligation of the vessel above the points of anastomosis of the various components of the venous system in the pampiniform plexus. An incision is made as for a herniorrhaphy, except that the length rarely needs to be more than 6 cm. unless a concurrent hernia is present. Should an unsuspected hernia be encountered, extension of the incision will be necessary. The aponeurosis of the external oblique muscle is incised down to or through the external inguinal ring and carried laterally to expose the internal ring. The cremaster muscle and fascia are incised longitudinally at the proximal end of the inguinal canal and the internal spermatic vein is dissected free for a distance



of about 5 cm. The vein is securely ligated at the internal ring and at the distal portion of the dissection. The vein is excised between the ligatures, with the proximal end allowed to retract into the abdominal cavity. In some instances the internal spermatic vein is formed inside the internal ring and there are 2 large branches instead of a single vein in the cord. Both veins are ligated in such cases. The incision in the cremaster muscle and fascia is closed transversely with a running suture. The distal end of the ligated vein may be included in this closing stitch. Closure of the cord in this manner causes elevation of the dependent left testicle. Careful search of the cord for possible indirect herniation should be done in all cases; when found, the hernial sac should be ligated high and the posterior wall of the inguinal canal repaired. Further closure of the wound should be done in layers. Postoperatively the patient should wear a scrotal support for about 1 week, allowed bath room privileges on the 1st postoperative day and gradual ambulation thereafter. Hospitalization unless herniorrhaphy is done is usually unnecessary after 3 or 4 days.

In 9 of the 10 patients the varicocele was dramatically reduced in size within 72 hours and in most cases was imperceptible to inspection within 10 days. The 10th patient had previously had a left inguinal hernioplasty done and the cord was so scarred that the vein could not be accurately identified and dissected. Eight of the 10 patients were relieved of their symptoms before discharge from the hospital on the 10th or 11th postoperative day.

The author reports that the high incidence of postoperative complications formerly seen following varicocelectomy have largely been eliminated and operative success greatly enhanced with this treatment of symptomatic varicoceles. (Am. J. Surg., September '50, R. A. Price)

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Leukemia in Radiologists in a 20 Year Period: Several years ago the author pointed out that the incidence of leukemia (in its narrower sense) was more than 10 times as great in radiologists as in non-radiological physicians. This difference was shown to be statistically significant. The present report is a continuation of the previous study and includes the ensuing 5 year period, 1944 to 1948, inclusive. The same method was followed as in the previous paper, extreme care being taken to obtain as complete figures as possible and to avoid any duplication or the inclusion of any non-pertinent subjects. It is probable that a very few of those listed as radiologists (but none of the leukemia cases) were in reality surgeons or other specialists who were members of one of the national radiological societies. This factor would tend to dilute slightly the actual incidence rate for bona fide radiologists.

During this 5 year period, the deaths of 15,762 United States physicians were reported in the Journal of the American Medical Association. During this same period, the Directory Report Service of the American Medical Association listed



19,529 deaths, the discrepancy resulting from the fact that the Journal does not publish an obituary for every physician who dies. Because causes of death are necessary to this study, the Journal's figures are being used. Leukemia was reported as the cause of death in 119 of these. During the same period, 124 radiologists died; in this group (all of whom had the cause of death recorded) 6 were reported as dying of leukemia.

It is seen from these figures that the incidence of leukemia in non-radiological physicians for this 5-year period is 113 in 15,637 (0.72 percent). The incidence of leukemia in radiologists during this period is 6 in 124 (4.84 percent). These percentages approximate those reported for the preceding 15-year period in both non-radiological physicians (0.44 percent) and radiologists (4.57 percent). This serves as some additional confirmation of the validity of the claim that the figures previously presented were statistically significant. The combined figures for the 2 decades 1929 to 1948 inclusive become: 65,992 non-radiological physicians died, of whom 334 died of leukemia. During this same 20-year period, 299 radiologists died, of whom 14 had leukemia. The overall incidence for non-radiological physicians is 0.51 percent and for radiologists 4.68 percent.

It is thus seen that the incidence of leukemia in radiologists is over 9 times as great as in non-radiological physicians. This order of increase is larger than was obtained in most of the experimental work on mice. In spite of the relatively low incidence rate in man, both groups under consideration, the non-radiological physicians and the radiologists, are now sufficiently large and the statistics cover a sufficient number of years for this difference in incidence rate to bear the stamp of validity. Statistically, there is only 1 chance in 1 billion of the observed increased incidence rate of leukemia in radiologists being coincidental.

It has been observed that the incidence of leukemia is almost twice as great in physicians as a whole as in the general adult male white population. The writer has pointed out that the bulk of this increase was due to the inclusion of radiologists in the statistics for physicians, and that when only non-radiological physicians were considered, the increased incidence is only slight and might perhaps be accounted for by the rather considerable number of non-radiological physicians who use fluoroscopes, Roentgen-ray machines, radium, and now radioactive isotopes in their clinical or investigative work.

This occupational hazard of radiology indicates that: (1) the hazard was not sufficiently appreciated, and insufficient care was exercised to employ standard means of protection against ionizing radiation; or (2) these standard means of protection are insufficient protection; or (3) they are too difficult to employ correctly in routine work. In this connection, the work of Archer at the University of Virginia is interesting. He has lately developed and exhibited a gown made of spun lead glass that affords much more complete protection to the body than conventional lead apron and gloves. (Am. J. M. Sc., September '50, H. C. March)

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From The Note Book

1. The Navy's oldest retired officer, LT George C. Lippincott, MC, USN, of Salem, N. J., and oldest living graduate of Jefferson Medical College, Class of 1875, was honored in a civic ceremony by the town of Salem on 18 September 1950, the 100th anniversary of his birth. A letter of congratulations from the Secretary of the Navy was presented at the same time by a representative of the Commandant, Fourth Naval District. Dr. Lippincott was retired for physical disability in 1886.

2. Treatment of early syphilis with 3 injections of penicillin and with 1 injection of penicillin is discussed in The Journal of Venereal Disease Information, Vol. 31, No. 9, September 1950, by R. D. Wright, F. P. Nicholson, and R. C. Arnold.

3. On Thursday, 14 September 1950, the Medical Library of the Naval Medical School, National Naval Medical Center, Bethesda, Md., was formally redesignated as the Edward Rhodes Stitt Library. The library was renamed to recognize Admiral Stitt's distinguished service as a pioneer and leader in the field of tropical medicine and as Surgeon General of the U. S. Navy from 1920 to 1928.

4. On 5 September 1950, the 12th class for instruction in Hospital Administration convened at the Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Md. The enrollment for this class is 22. At the same time, a 9 month course was begun for Medical Administrative Technicians, the class consisting of 94 chief petty officers and petty officers first class. Two enlisted Hospital Corps women are included.

5. The Dental Research Facility of the Administrative Command, Naval Training Center, Great Lakes, Ill., presented one of 4 Navy exhibits at the 1950 Minnesota State Fair.

6. Caution in the use of certain organic phosphorus insecticides is emphasized. (J. A. M. A., 9 September '50)

7. The male toad of the species Bufo arenarum was used in 127 tests of pregnancy with an accuracy of 99.2 percent. No false positive result was encountered. (Am. J. Clin. Path., September '50, C. K. Jones and H. W. Jones)

8. The skin complications of cortisone and ACTH therapy are discussed in the J. A. M. A. of 16 September 1950. (H. T. Behrman and J. J. Goodman)

9. Medical problems encountered in undersea craft were presented by RAD Lamont Pugh, MC, USN, at the annual session of the A. M. A. (J.A.M.A., 16 September '50)



10. An unspecified number of WAVE hospital corpsmen in 1st, 2d, or 3d class petty officer ratings will be ordered to duty in the near future.

11. Four programs are now available to dental students and graduate dentists. These are: (1) appointment as Ensign (Hospital Probationary)(Dental), U. S. Naval Reserve, available to freshmen, sophomore, junior, and senior dental students; (2) The Senior Dental Student Program for selected senior students; (3) Commission in the Dental Corps of the Naval Reserve for Doctors of Dentistry upon graduation from an accredited college; (4) Opportunities offered to Regular Navy Dental Corps Officers.

12. For the week ending 16 September 1950, new cases of acute poliomyelitis reported in the Nation numbered 2,138, a 22.5 percent increase over the 1,745 cases reported in the previous week. This is the 17th consecutive week which shows an increase over the preceding week. For the corresponding week in 1949 2,622 cases were reported. The cumulative total (16,236) for the current "disease" year was below the corresponding total (28,157) for last year. The states reporting the largest number of cases were New York (377), Michigan (135), Ohio (126), Illinois (117), Pennsylvania (112), and California (66).

13. The World Health Organization, which has already set up regional organizations in the Eastern Mediterranean area, Southeast Asia, the Americas, and a special office for Europe, is now preparing for the creation of a new regional organization for the Western Pacific area. The area provisionally includes Australia, China, the Philippines, South Korea, New Zealand, Japan, Malaya, and Singapore comprising over 600 million people. Although the separate organization is new, the agency has already worked in the region in fields ranging from campaigns against malaria, tuberculosis, and venereal diseases to the training of nurses and surgeons. (Science, 15 September '50)

14. The USNH, St. Albans, N. Y., reports that 35 mm. Kodachromes made from the microscopic slides of "The Effects of Ionizing Irradiations on Swine" have received many favorable comments from civilian activities using the material for group presentation or individual study. (Refer to BuMed Cir. Ltr. 50-41, dated 20 April 1950)

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Current Morbidity: Venereal Disease: During the years 1947 through 1949 the total incidence for diseases, injuries, and poisonings dramatically decreased. Indeed, in 1948 and 1949 all-time low incidence rates were established. The reduction in the incidence rates for venereal disease has been one of the major factors responsible for the decrease in the total disease incidence rates among Naval personnel.

Following the war, the incidence rate for venereal disease reached a high of 110 per 1,000 in October 1946. However, since that time the rates have decreased sharply, reaching a post-war low of 32 per 1,000 in December 1949--more than 70 percent below the rate for October 1946. This general improvement was evidenced in all geographical areas.

During 1950 the incidence rates have been only slightly higher than the low reached in December 1949. The highest rate this year has been 40 per 1,000 in May, the lowest 34 per 1,000 in April. (Stat. Navy Med., September '50)

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USN Immunizations, 1949: During the calendar year 1949, a total of 1,471,983 immunizations were given to personnel, afloat and ashore, of the Navy and Marine Corps. The number of complete immunizations given in continental naval activities outnumber those given in extracontinental stations and on ships of the fleets by a ratio of 2 to 1. This would be expected, since the majority of the naval forces, including recruits who are required to receive vaccine injections (cowpox, tetanus toxoid and typhoid fever) soon after entry into the service, were stationed in the United States. In proportion, a greater number of yellow fever, plague, and typhus vaccines were administered in extracontinental activities, and ships in regions endemic with these diseases, than in continental districts.

In less than 4 percent of the immunizations administered were reactions, in varying degrees of severity, reported. Nearly all of these reactions were reported as mild in nature and were not taken up on the sick list. For vaccines given to ships' personnel, almost 7 percent showed reactions. The higher proportion of reactions to immunogenic agents reported for injections administered on board ships than in shore establishments is possibly due to the close contact between the Medical Department and men aboard vessels, with the result that reaction readings are made more frequently than at shore stations. (Stat. Navy Med., September '50)

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Inactive Reserve MO's: Active Duty and Pay: It is announced that: The Bureau of Naval Personnel, on 15 September 1950, granted authority to the Commandant, Potomac River Naval Command and Commandants of Naval Districts, except the 10th, 15th, and 17th, to issue appropriate duty orders with pay, without regard to rank, to inactive reserve medical officers for the primary purpose of conducting physical examinations for active duty, training duty, and procurement at training centers or other selected places to the extent vacancies exist in Organized Reserve Medical Officers billets. Orders issued will further provide that physical examinations for promotion and quadrennials or other required purposes are also to be conducted. Acceptance of such orders will NOT increase the possibility of involuntary recall of the medical officers concerned. (Professional Div., BuMed)

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Course in Environmental Sanitation Technic for Hospital Corpsmen: The first course of instruction in Environmental Sanitation Technic will be conducted for enlisted Hospital Corps personnel at the Naval Hospital, Oakland, California, beginning about 1 November 1950 and continuing for 16 weeks. Personnel for this initial class have already been assigned. However, a new class will convene 16 weeks later and at 2 months' intervals thereafter.

The training will enhance that previously given to Epidemiology and Sanitation Technicians and Malariology Technicians, and will include additional and improved methods of controlling and eliminating health hazards in the environment. Instruction will be offered in such subjects as administration and organization, bacteriology and immunology, epidemiology and entomology, vital statistics, and military sanitation.

Each class of 20 hospital corpsmen will receive 640 hours of instruction during the 4 months of training. Quotas are assigned to the various commandants for assignment to this school. (HC Enlisted Branch, Personnel Div., BuMed)

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Films on Diagnosis of Diphtheria: The Public Health Service of the Federal Security Agency has available on free loan a complete series of motion pictures on Laboratory Diagnosis of Diphtheria. Film No. 1 (in sound, B&W, 13 min., 480 feet) depicts the collection and treatment of initial cultures, their microscopic study, and the isolation of pure cultures of Corynebacterium diphtheriae. Film No. 2 (in sound, B&W, 11 min., 410 feet) depicts the procedures used in determining the cultural types of C. diphtheriae. Film No. 3 (in sound, B&W, 13 min., 477 feet) depicts procedures to determine the virulence of pure cultures of C. diphtheriae by animal inoculations. Film No. 4 (in sound, B&W, 12 min., 425 feet) shows in detail how to determine the virulence of C. diphtheriae by an inexpensive in vitro test, without the aid of animals. These films are valuable to all personnel interested in the fields of public health, medicine and allied sciences, and for teaching purposes. Those interested in procuring these films should communicate with The Medical Director in Charge, Communicable Disease Center, 605 Volunteer Building, Atlanta, Georgia.

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List of Recent Reports Issued by Naval Medical Research Activities:

Naval Medical Research Institute, NNMC, Bethesda, Maryland.

The Propagation of Japanese Encephalitis Virus in the Mosquito by Parenteral Introduction and Serial Passage, 2 August 1950, NM 005 048.03.11 (Formerly NM 005 007).

Thermodynamics of Adsorption on an Elastic Adsorbent, 7 August 1950, NM 000 018.06.01.

Composition and Effects of Vapors Emanating from Insulated Electrical Equipment under Conditions of Simulated Submarine Operation, 8 August 1950, NM 004 005.02.01.

Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

Bacteriological Evaluation of Quinn Purifier and Steri-Canteen, September 1950, NM 005 052.08.12.

Trailer Mounted Mecon Laboratory, September 1950, NM 007 083.04.01.

Evaluation of Ethylene Oxide as a Sterilizing Agent for Field Use, September 1950, NM 005 052.19.

A Method for Concentrating Fluid Milk, September 1950, NM 005 052.10.02.

Note: Those interested in seeing copies of the complete reports should address their request to the research activity from which the report originated.

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BUMED CIRCULAR LETTER 50-101

14 September 1950

From: Chief, Bureau of Medicine and Surgery

To: All Ships and Stations

Subj: Requisitioning, Receipt Procedures, Stock Levels, and Priority Indicators for Medical and Dental Stores

Ref: (a) BuMed Cir. Ltr. 48-73  
(b) BuMed Cir. Ltr. 48-92  
(c) BuMed Cir. Ltr. 48-143  
(d) BuMed Cir. Ltr. 49-134  
(e) Par. 23004, Volume II, BuSandA Manual (Priority Indicators)  
(f) Par. 23101, Volume II, BuSandA Manual

Encl: (1) Preparation and submission of BuMed Material Requisition, NavMed-4  
(2) Procedures to be employed in requisitioning nonstandard medical and dental supplies and equipment  
(3) Stock levels of medical and dental stores  
(4) Procedures for receipt of medical and dental supplies and equipment direct from contractor when charged to medical stores allotment of the Bureau



(5) Priority of requests for medical and dental materials

Enclosures (1) through (5) of this circular letter state in detail the procedures necessary for requisitioning, receipt procedure, stock levels, and priority indicators for medical and dental stores.

The letter with enclosures appears in 15 September 1950 Navy Department Bulletin.

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BUMED CIRCULAR LETTER 50-102

14 September 1950

From: Chief, Bureau of Medicine and Surgery

To: All Ships and Stations

Subj: Photodosimetry Program: Modification of

Ref: (a) BuMed Circular Letter 48-10

1. Paragraph 6.2 of enclosure (A) to reference (a), Navy Department Radiological Safety Regulations, directs the processing and reading of film badges at the end of each calendar week.
2. Exposure levels, as revealed by photodosimetry reports, indicate the feasibility of processing and reading film badges at the end of every other calendar week.
3. Therefore, paragraph 6.2 of enclosure (A) to reference (a) is modified to the extent that film badges will be processed and read at the end of every other calendar week except as provided in paragraph 4 below.
4. Processing intervals may be varied at the discretion of a qualified radiologist or radiological safety medical officer, with a maximum interval period of four weeks.

- H. L. Pugh, Acting

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BUMED CIRCULAR LETTER 50-103

20 September 1950

From: Chief, Bureau of Medicine and Surgery

To: Distribution List

Subj: Report of Staffing Ratios at Medical Treatment Facilities  
(Report Symbol DDOMS-3)

1. The Department of Defense requires information on the distribution of staff personnel in medical treatment facilities to duties relating to in-patient care, out-patient care, and other duties, and has directed the submission of monthly reports of such data beginning 31 October 1950. Accordingly all naval hospitals (except USNH, Yokusaka) and all continental Navy and Marine Corps stations which provide medical treatment facilities for in-patients, out-patients, or both, shall submit to this Bureau a monthly letter report covering the following items. The first report shall be submitted as of 31 October 1950.

a. Staff personnel on date of report:

|                                | Total | Military | Civilian |
|--------------------------------|-------|----------|----------|
| Authorized allowance - - - - - |       |          |          |
| Interns - - - - -              |       |          |          |
| Residents - - - - -            |       |          |          |
| Other physicians - - - - -     |       |          |          |
| All other, officers, en-       |       |          |          |
| listed, civilian - - - - -     |       |          |          |
| Currently assigned - - - - -   |       |          |          |
| Interns - - - - -              |       |          |          |
| Residents - - - - -            |       |          |          |
| Other physicians - - - - -     |       |          |          |
| All other, officers, en-       |       |          |          |
| listed, civilian - - - - -     |       |          |          |

b. Full-time personnel equivalent of those currently assigned (military and civilian combined):

|                            | Total | In-patient<br>Service | Out-patient<br>Service | Other<br>Duties |
|----------------------------|-------|-----------------------|------------------------|-----------------|
| Interns - - - - -          |       |                       |                        |                 |
| Residents - - - - -        |       |                       |                        |                 |
| Other physicians - - - - - |       |                       |                        |                 |
| All other, officers, en-   |       |                       |                        |                 |
| listed, civilian - - - - - |       |                       |                        |                 |

c. Work load:

Patients occupying beds at end of month

Out-patient work units during month

\_\_\_\_\_

\_\_\_\_\_



2. In table (a) all staff personnel are to be counted, whether assigned full time or part time to the medical treatment facility. Interns and residents shall be entered separately. Army and Air Force personnel, if authorized or assigned shall be counted with naval personnel as military. For the purpose of this report, "currently assigned" personnel include civilian employees carried on the pay roll on the date of the report, and military personnel on the unit rolls on the day of the report and over whom the unit normally exercises administrative control (including those present for temporary duty and excluding those absent on temporary duty elsewhere.

3. The personnel reported as "currently assigned" in table (a) shall be distributed in terms of "full-time personnel equivalents" in table (b). If all personnel reported are assigned full time to the medical treatment facility, the "total full-time personnel equivalent" will be identical with the "total personnel currently assigned." However, if 12 persons are "currently assigned," of whom 10 are assigned full time and 2 only half time at the treatment facility, then the full-time personnel equivalent would be 11 rather than 12. The total full-time personnel equivalent shall be distributed to "in-patient service," "out-patient service," and "other duties" in accordance with best available estimates of the proportion of time spent by staff personnel in these duties; it is not required, intended, nor desired that an actual measurement be made of time spent in the various types of duties.

4. The following will serve as a guide to the types of duties to be considered as contributing to "in-patient service," "out-patient service," and "other duties":

a. In-patient service: Ward, operating room, and the various clinical and therapeutic services; hospital administration, supply and food services; patient and staff welfare and recreation; hospital maintenance and repair including staff housing. Services of X-ray, laboratory, and pharmacy which may be utilized by both in-patients and out-patients shall be prorated according to best estimates.

b. Out-patient service: Include all individuals specifically detailed to full or part-time work in the out-patient dispensary or clinic plus a prorated share of the doctors, nurses, and corpsmen assigned to X-ray, laboratory, and pharmacy.

c. Other duties are those not directly related to the care of patients nor necessary for direct support of essential treatment facility activities: post, base, or yard preventive medicine and sanitation duties; care of the dead; research; physical evaluation boards; personnel assigned to the activity for military convenience only.

5. Table (c), work load:

a. "Patients occupying beds" equals the patient census minus those on leave, absent without leave, or subsisting elsewhere.

b. Out-patient work unit is "a single treatment (or visit), a complete physical examination of the SF88 type, or immunization administered to an individual not occupying a hospital or infirmary bed (or dispensary bed)". This figure is to cover all types of personnel, active duty and supernumeraries. This figure may be derived by hospitals from the same source that provides the figure for out-patient treatments and examinations reported quarterly on Med-063; and by other activities from the source that provides similar figures reported on NavMed-E.

-C. A. Swanson

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BUMED CIRCULAR LETTER 50-104

22 September 1950

From: Chief, Bureau of Medicine and Surgery  
To: All Naval Hospitals

Subj: Hospitalization, Retired Personnel

Ref: (a) BuMed Circular Letter 50-98

1. Reference (a) is hereby modified.

2. The Veterans Administration now advises that Veterans Administration Form 10-P-10 and the letter requests referred to in paragraph 2 of reference (a) should be forwarded to the Veterans Administration Regional Office having jurisdiction over the geographical area in which the naval medical facility is located, in all cases coming within the purview of Executive Order 10122 of 14 April 1950.

3. In view of the above it is directed that in paragraph 3 of reference (a) the following be deleted: "within the same region. If the member desires hospitalization in a Veterans Administration facility under the jurisdiction of a different Veterans Administration Regional Office, the request should be submitted to the Veterans Administration Central Office, Washington, D. C."

-C. A. Swanson

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BUMED CIRCULAR LETTER 50-105

26 September 1950

From: Chief, Bureau of Medicine and Surgery  
To: All Ships and Stations



Subj: Purchases of Blood During Fiscal Year 1951

1. Effective with the first quarter, F. Y. 1951, addressees are directed to submit to the Bureau of Medicine and Surgery, within 15 days following the end of each quarter, a "Quarterly Report of Cumulative Obligations for Purchase of Blood," (Report Symbol DDSD-7).
2. The report shall be submitted in letter form, and shall include all obligations and expenditures of appropriated funds for whole blood, regardless of source from which purchased.
3. Please direct reports to the Bureau of Medicine and Surgery, Code 23.
4. Negative reports are not required.

-C. A. Swanson

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ALNAV 96

15 September 1950

Subj: Authority to Award the Purple Heart

Authority to award the Purple Heart is hereby delegated to all Commanding Officers in the grade of Captain (Colonel in the Marine Corps) and to all Flag Officers (General Officers in the Marine Corps) in the chain of command.

-SecNav Francis P. Matthews

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ALNAV 98

18 September 1950

Subj: Dried Plasma: Use of

Reference BuMed Circular Letter 49-51, January - June 1949 Navy Department Bulletin 49-313, page 78. Until further notice any dried plasma on hand may be used regardless of expiration date provided there are no apparent defects in diluent containers or recipient sets. Depots and all other activities will issue freshest plasma available to units in actual combat.

-SecNav Francis P. Matthews

ALNAV 101

19 September 1950

Subj: Additional Pay, Career Compensation Act 1949

Public Law 779, approved 9 September 1950, provides that commissioned officers of the Medical Corps or Dental Corps of the Naval Reserve called or ordered to active duty with or without their consent shall, if otherwise qualified, be entitled to the additional pay of \$100.00 per month authorized by the Career Compensation Act of 1949. Entitlement this pay for such officers involuntarily called or ordered to active duty prior to receipt of this AlNav shall, provided otherwise proper, commence 9 September 1950 or date of commencement of active duty pay and allowances, whichever is later. Payment not authorized to commissioned officers of the Medical Corps or Dental Corps of the Navy and Naval Reserve while serving as medical or dental interns unless such members entitled to saved pay under the provisions of the Career Compensation Act of 1949. Credit of this compensation on the pay record does not require substantiation. Para 54317 BuSandA Manual modified accordingly. Restrictions contained Para 54317-1 Baker 3 and 4 BuSandA Manual continue in effect.

Comptroller General has ruled that enlisted members who voluntarily reenlist or extend their enlistments accordance AlNav 72-50 are entitled payment travel allowance and lump sum payments for unused leave. Accordingly AlNav 85-50 hereby cancelled and disbursing officers authorized effect otherwise proper payment such allowances.

-SecNav Francis P. Matthews

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NAVY DEPARTMENT  
BUREAU OF MEDICINE AND SURGERY  
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

Permit No. 1048  
NavMed-369 - 9/50

PENALTY FOR PRIVATE USE TO AVOID  
PAYMENT OF POSTAGE. \$300